THE

AMERICAN JOURNAL OF PHARMACY.

FEBRUARY, 1871.

DECOMPOSITION OF ACETATE OF MORPHIA IN SOLUTION.

By John M. Maisch.

Read before the Philadelphia College of Pharmacy Dec. 20, 1870.

That aqueous solutions of the salts of most officinal alkaloids cannot be kept for indefinite periods is well known to all pharmacists. Whether distilled water, or boiled and filtered hydrant water—the latter containing but traces of foreign matter—be used for such solutions, whitish floccules usually make their appearance after some time, and gradually assume a soft gelatinous consistence, with the appearance of algaceous growth. In the few instances in which the writer assayed such altered solutions of the sulphates of quinia and of morphia, a diminution of the amount of alkaloid has not been observed, and the appearance of this foreign body was therefore rather attributed to accidental organic impurities in the water, and this belief was strengthened by the fact that the bulk of these flocks varies in solutions made at different times, and after some time apparently does not increase, and that the presence of an excess of sulphuric acid prevents such a formation or at least diminishes its amount.

It is also well known that a neutral solution of acetate of ammonia gradually deposits flocks, and that the liquid then assumes an alkaline reaction. This was first observed by Horst,* who attributes this decomposition of aqueous solutions of acetate and succinate of ammonia to the light, and recommends to keep them in a dark place; if ammonia was replaced by potassa or soda, this decomposition did not take place. I am not aware that the amount of ammonia has ever been estimated in the fresh solution and after the decomposition has taken place.

* Archiv d. Pharm. 1823. Buchner's Repertorium, xviii, 481.

A solution of acetate of morphia is very prone to change; it soon acquires a brown yellowish color, and deposits a brown matter. A decomposition was already observed by E. Merck in 1837,* when experimenting about the best process for obtaining this salt dry, in a neutral condition; he states that the evaporation of its solution must be hastened at a low temperature by a current of air or other means, since it is decomposed at too slow an evaporation. But the nature of this decomposition is not stated.

Some months ago, Dr. Wm. T. Taylor, of this city, informed me that he prefers to use a solution of this salt for hypodermic injection, and that he had repeatedly observed the separation in the liquid of one or more crystals, after keeping it on hand for some time. A careful examination of a crystal proved it to be pure morphia, entirely free from acetic or other acid; with nitric and iodic acids, and with sesquichloride of iron, it showed the reactions characteristic for morphia; it had an alkaline reaction to test papers, and neither acetic, carbonic or any mineral acid could be discovered by the appropriate tests; heated upon platinum foil it was consumed without leaving any residue.

The liquid had deposited a considerable quantity of a brown matter, and was of a pale brownish color. It was neutral to test paper, but with pure sesquichloride of iron acquired a reddish tint, which disappeared on the addition of muriatic acid. Acidulated with nitric acid, iodohydrargyrate of potassium occasioned a turbidity. Evidently a minute portion of acetate of morphia remained still in solution.

To the kindness of Dr. Taylor I am indebted for the specimen upon the table, which was originally a solution of 8 grains acetate of morphia in half an ounce of distilled water. By accident, it had been set aside, and was lost sight of for several months. On examining it, the deposit and the change in color of the solution, mentioned before, were observed, and a single crystal reaching from the surface of the liquid diagonally through the solution to the bottom of the vial on the opposite side.

The gradual decomposition of acetic acid in crude vinegar is well known, and it is possible that the changes noticed above are of the same or a similar nature. At any rate it is very evident that acetic

* Archiv d. Ph. xxiv, 46. Buchner's Repert. lxiv, 265.

acid, in contact with organic bodies, is very liable to undergo decomposition, and since an organic body in such a condition is apt to predispose others, with which it may be in direct contact, to similar changes, it is a question of great moment whether the addition of acetic acid to our officinal fluid extracts of ergot and of ipecacuanha may not be more detrimental than useful.

ON THE PRECIPITATION OF QUINIA BY IODIDE OF POTASSIUM FROM ACID SOLUTIONS.

By J. M. Maisch.

Read before the Philadelphia College of Pharmacy, at the Pharmaceutical Meeting, Dec. 20, 1870.

Some time ago the following prescription was received:

R. Quiniæ Sulphatis,	gr. xv.
Potassii Iodidi,	ʒi.
Tinct. Ferri Chloridi,	ʒi.
Aquæ,	ʒiv.
Syrupi Zingib.,	ʒi.

M.

The quinia salt was dissolved in the tincture of iron, the potassium iodide in the water, and the solutions mixed; a brown precipitate was at once formed. The quinia salt was now dissolved in the water with the addition of a little dilute sulphuric acid, the iodide added, and after solution had taken place, the tincture of iron; the same result was produced.

It was now supposed that the iodide might contain some iodate, that on the addition of an acid, iodine was liberated, which, with the excess of iodide, would form biniodide of potassium, and that the precipitation occurred in consequence of the presence of this compound. But when the solution of the iodide (Atkinson & Biggar's) was acidulated with muriatic acid, a reddish color was not produced, nor would starch paste brought in contact with the liquid acquire a blue color; iodic acid was therefore not present.

Righini stated (Journal de Chim. méd. xiii, 116) that bisulphate of quinia produces with iodide of potassium a red pulverulent precipitate.

A considerable quantity of iodide of potassium was dissolved in a solution of one part of sulphate of quinia in 20 water, the solution of

the latter salt having been effected with just enough dilute sulphuric acid. A white precipitate was the result, doubtless owing to the presence of some quinidia in the quinia salt; for a solution of one part of quinia sulphate in 40 of water, effected with a sufficient quantity of sulphuric acid, remained clear on the addition of iodide of potassium in substance. When a considerable excess of pure sulphuric or muriatic acid was used for dissolving the quinia, the addition of solution of potassium iodide occasioned no turbidity or sediment; therefore the observation of Righini is not correct as far as it relates to neutral potassium iodide.

A solution of sulphate of quinia (1·40) with just sufficient acid was prepared, iodide of potassium added, and then solution of citrate of iron; a white turbidity with the gradual production of a bright red precipitate was the result.

The same quinia solution was made, except that a considerable excess of dilute sulphuric acid was used; after the solution of iodide of potassium had been effected, every drop of the solution of iron citrate occasioned a brownish white precipitate, which rapidly changed through various shades into deep brown. If the order of mixing was reversed, the potassium iodide yielded with dilute sulphuric acid a colorless solution, which became turbid and turned brown with the iron citrate, and now yielded with solution of quinia a darker colored precipitate, changing more readily.

If an aqueous solution, or the tincture of sesquichloride of iron, diluted with water so that the iron color can scarcely be perceived, is mixed with solution of potassium iodide, an iodine color is at once produced, doubtless owing to the formation of ferric iodide: $Fe_2Cl_3 + 3KI = Fe_2I_3 + 3KCl$. But since in a mixture of solutions of different salts the acid and bases interchange in part, provided an insoluble compound be not formed, a mixture of the two solutions must contain Fe_2Cl_3, Fe_2I_3, KI and KCl; the third equivalent of iodine in Fe_2I_3 being but loosely combined, we have in the above mixture practically KI_2, and obtain with it in quinia solutions the same precipitate which we observe on the addition of Lugol's solution.

The appearance of the red or brown precipitate which, according to Righini, contains quinia, hydriodic acid and iodine, depends therefore on the presence of KI_2, or if KI be used, on the presence of some other compound producing the former.

The precipitate obtained in putting up the above prescription, after

having been well washed with water, forms a brown powder having a slight odor of iodine, which is slowly evolved. When the precipitate is treated with ammonia, it changes to a dull cinnabar color; dissolved in acids, it yields a copious precipitate with iodohydrargyrate of potassium. Heated upon platinum foil, it decomposes, leaving a bulky charcoal, which is burned with difficulty without leaving any residue behind. The precipitate therefore contains, besides the elements of quinia, only iodine.

ON EMULSION OF ALMONDS.

By H. P. Reynolds.

The officinal emulsion of the U. S. P. forms an elegant and suitable vehicle for the administration of many pungent or acrid medicines, but no apothecary cares to spend time for its extempore preparation, and of course it cannot be kept on hand on account of the readiness with which it ferments.

Experimenting recently, by request of a physician, for a satisfactory vehicle for chloral hydrate, I found the emulsion of almonds peculiarly adapted to the purpose, both by reason of its agreeable taste and its thick consistency almost completely obscuring the pungency of the drug. Chloral is now so largely administered in that class of diseases accompanied by an irritated and sensitive condition of the mouth and throat that this seemed a point gained. And it may not be amiss to state here that syrupus acaciæ slightly flavored with orange-flower water and essential oil of almonds is a very agreeable vehicle for the chloral.

Finding I should be called upon to provide the emulsion for this purpose it became desirable to have it on hand in a convenient and permanent form. I therefore contrived a preparation which I call a "Concentrated Emulsion of Almonds," and which is prepared as follows:

℞	Sweet Almonds, (blanched)	
	Sugar,	
	Glycerin, ("C. P.")	each one ounce.
	Powd. Gum Arabic,	one drachm.
	Water,	two ounces.

Rub to a uniform paste, strain through muslin and evaporate by a heat *not exceeding* 150° F., to the consistency of a fresh solid extract. Preserve in wide mouth bottles of size for convenient use. It may

be flavored to suit; I have preferred orange flower water and oil of almonds. When emulsion of almonds is prescribed it is readily prepared as follows:

℞

Concentrated Emulsion, two drachms.
Water, sufficient to make one ounce of mixture.

Mix thoroughly.

It immediately assumes the milky hue and consistence of the officinal article, and cannot be distinguished from it, while it keeps without change and without drying. The idea may not be new to all your readers, but certainly is original so far as I am concerned, and I shall be happy if the suggestion proves useful to any of them, as it can hardly fail to do.

Plainfield, N. J., Dec. 28th, 1870.

SYRUPUS CROCI.

To the Editor:

Dear Sir:—For some time past I have been called upon to make considerable quantities of syrup of saffron, and not knowing of a reliable formula, the one I herewith send you for publication presented itself and am happy to state produced the finest preparation of the kind I ever saw. As commonly prepared, it is apt to ferment, and of course is worthless; during the summer months I have found it to ferment with ease. This is entirely obviated by substituting glycerin for sugar, according to the formula I send you. I have some in my store which I made eight months ago and it is as perfect as when first made. In making this syrup I use part glycerin instead of sugar. We all know that the medical properties of saffron are due to the volatile oil, and in order to obtain this we must guard against heat in the preparation of the syrup, and make it cold, as when heat is used it drives off part of the volatile oil. The next point is to use something that will dissolve the vol. oil from the saffron, and for that purpose I have used glycerin, and find it to work admirably.

Take of true Saffron,	. .	℥ss.
Glycerin,	. .	℥ij.
Water,	. .	℥vi.

Let the above macerate for seven days, filter into a pint bottle and add water through the filter q. s. to make ℥viii, then add sugar 14

oz. av. and dissolve cold by frequent agitation. The result is a beautiful thick, dark orange-colored syrup.

I present this to the readers of the Journal. In case they are in want of a formula, they will find this a reliable one.

Yours respectfully, GEO. W. KENNEDY.

Pottsville, Pa.. Jan. 9th, 1871.

ON QUINIA, AND SOME ANALOGOUS SUBSTANCES IN PRESCRIPTIONS AS TONICS AND EFFICACIOUS ANTIPERIODICS.

By J. B. R. PURNELL, M.D., of Snowhill, Md.

The object of what follows (a part of which has before appeared in the *Medical and Surgical Reporter*, Oct., 1869,) is not to allude to medicine of agreeable taste any more than to speak of certain combinations as more efficacious antiperiodics than quinia sulphate alone. Nevertheless, a knowledge of means of disguising any disagreeable taste—whenever this is possible without damage to remedial power—is and ought to be admitted as important, a palatable remedy being essential in a great many cases to comfort, in not a few to a cure. And, having noticed several accounts of formulæ intended to conceal the bitterness of quinia, I am induced to make some statements—conclusions which I think can be relied upon, being arrived at by some years of observation and many experiments made with care.

Ext. glycyrrhizæ alone (better with a little tannic acid) answers a good purpose with many patients, but a large proportion is usually required (5 grs. may be used for each grain of quinia sulphate or 2 grains of cinchonia sulphate), and I find the taste of the extract is more often objected to than that of some other things that may be used—hence the importance of a knowledge, if possible, of a variety of substances to be employed to destroy the bitterness.

Tannic acid used in large proportion with quinia sulphate—less for cinchonia sulphate or the alkaloid quinia—conceals the bitterness, and the fact may be well known to the profession generally, or the majority; but it is probably not generally known that a slightly bitter taste of tannate of quinia—more properly a minute portion of precipitated quinine—will be perceived, though not until about a half minute after swallowing the mixture. The same is perceived, to some extent, in the case of any other combination by which the bitterness of quinia or cinchonia is disguised, but is probably more distinct with

the tannic acid mixture; to prevent this it is only necessary to rinse the mouth with water, or with cold tea, which is better.

In the first place, however, it is important to know whether the medical properties of a remedy are at all impaired by the substance used to disguise its taste; and there is evidence that there are many practitioners who would be unwilling to depend upon quinia sulphate combined with tannic acid in large proportion as an antiperiodic.

Quinia in the form of tannate in solution (or rather, in mixture) I have used for several years (in over a thousand cases), and believe it to be in no case less, oftentimes more, efficient as an antiperiodic than sulphate of quinia alone.

Without the aid of any other substance eight grains of tannic acid will be required to entirely cover the taste of ten grains of quinia sulphate; it is better, however, to use less and in combination with aromatics unless an astringent be indicated. But the roughness of tannic acid is unpleasant to many persons. To prevent this, add sugar in abundance and a little aromatic. But if sick stomach should be present much sugar cannot be retained or will be refused, (true at least in the majority of cases) and this will be a trouble; and if to the same person the taste of tannic acid should be very unpleasant, there will be another trouble, and the difficulty will be increased. Now in this case, as well as the case of a patient who for any other reason objects both to sweet medicine and tannic acid, if, while employing but little sugar, we use rather less tannic acid and a large instead of a small quantity of aromatic, and dilute the dose sufficiently —though unnecessary to dilute very largely—we will generally succeed. Though in regard to quinia sulphate directly, a small quantity of aromatic, however used, can accomplish nothing, and the effect of a large quantity, when employed alone, is too trivial to make it useful, the same (large quantity) will nevertheless assist much in disguising it, provided a certain proportion of tannic acid be present.

Some persons who sweeten quinine, expecting by this means to somewhat diminish the bitter taste, only add to the trouble, for the bitterness is increased by the addition of sugar without any other substance, or at least is not lessened in the slightest degree, and is caused to be perceived for a much longer time for the reason probably that it imparts an adhesive property to the solution which, consequently, remains longer on the organs of taste and penetrates.

Cinchona, though containing the alkaloids and not usually requiring

tannic acid—a fact readily accounted for from the presence of Cinchotannic acid—will be sufficiently disguised by the use of sugar, cinnamon and orange. Tr. cinchonæ comp., already containing aurantii cort., will require only sugar and cinnamon. For tr. gentianæ comp. tannic acid and sugar may be used, though the addition of syr. sarsaparilla comp. or ext. sars. fl. co. will greatly improve it, or either of the last two named with an aromatic alone can be employed. A palatable and efficient elixir of cinchona may be found in Parrish's Pharmacy. The following recipes will be adequate to the end proposed:

℞

Tr. Cinchonæ Comp.,	f ℥v.
Tr. Calumbæ,	f ℥iij.
Spt. Lavandulæ Comp.,	
Tr. Cinnamomi, *aa*	f ℥ij.
Syr. Aurantii,	f ℥ss.
Ext. Glycyrrhizæ,	℥ss. M.

℞

Tr. Gentianæ Comp.,	
Tr. Cinchon Comp., *aa*	f ℥ss.
Ac. Tannici,	gr. ij.
Syr. Sarsaparillæ Co.	f ℥i.

M.

℞

Tr. Cinchon Co.,	f ℥ss.
Ferri et. Potass. Tart.,	℥j.
Spt. Cinnamomi,	f ℥ss.
Curacao,	f ℥ij.
Sacch. Alb.,	℥ij
Aquæ,	f ℥iij.

M.

The fer. et potass. tart. here serves a twofold purpose, since it helps materially to conceal the bitterness. The following formulæ will generally prove efficacious as tonics or antiperiodics, and not impalatable to the majority of persons, and may be varied somewhat according to the case and the taste of the patient.

℞

Quinia Sulphatis,	gr. xv.
Cinchoniæ "	gr. x.
Acidi Tannici,	gr. x.
Syrupi,	
Syr. Aurantii Cort., *aa*	f ℥vj.
Ol Aurantii,	
Ol Sassafras, *aa*	gtt. iij.
Aquæ Cinnamomi	f ℥ij.

Misce.

℞

Quiniæ Sulph.,	gr. xx.
Liq. Potassæ arsenitis,	m. xx.
Acidi Tannici,	gr. xij.
Syr. Aurantii Cort.	f ℥vi.
Aq. Menth. Pip.	f ℥iij.

M. S. f ℥j ter die. As an antiperiodic f ℥ss—f ℥ij.

℞

Quiniæ Sulph.	gr. xv.
Cinchoniæ "	gr. viij.
Ac. Tannic,	gr. v.
Ext. Sarsapar. Fl. Co.	f ℥iij.
Syr. Sarsapar. Co.	f ℥iss.
Aquæ,	f ℥i.

M.

℞

Quiniæ Sulph.,	gr. xx.
Cinchoniæ Sulph.,	gr. xv.
Ac. Tannic,	gr. vi.
Syr. Sarsapar. Comp.	f ℥iiiss.
Ol Anisi,	m. vi.
Tr. Cinnamomi,	f ℥iij.

M. S. f ℥j ter die. As an antiperiodic, f ℥ss—i.

To prevent the slightly bitter taste which begins to be perceived about a half minute after swallowing the dose, rinse the mouth with water, or with cold tea, which is better.

Coffee (if a good article) in strong decoction, or prepared by displacement or in powder, while it adds to the antiperiodic effect, disguises the taste of a large proportion of the sulphates of quinia and cinchonia and like bitters, as well as some other remedies, not impairing the medical properties, and though not new it seems not to be generally known. It is, perhaps, generally known to have been much used to conceal the taste of senna and magnesia sulphate, and in regard to quinia, Waring mentions the fact on page 229, Practical Therapeutics. He says, "Coffee is of importance as a means of disguising the taste of nauseous medicines, particularly quinine, senna and epsom salts." It is to be remembered, however, that a weak preparation will not do.

℞ Coffee ½ teacupful, Water Oiss.

Use no milk with it unless a very small quantity only is desired to flavor; with or without sugar according to taste.

In relation to this subject there is an important fact to be borne in mind. The quinia or cinchonia sulphate should be put in the coffee in form of powder. If dissolved first with an acid a decided bitterness will be perceived. So, in the case of anything employed to conceal the taste of quinia sulphate and like bitters, use the bitter in powder, avoiding an acid or (with a few exceptions) any perfect solution.

Cocoa or chocolate, if the quinia sulphate is not in large proportion, conceals the taste to a great extent, provided it be used of a sufficient strength, as in the solid or semi-fluid state. For cinchonia sulphate it will do better, since the taste of this substance is not so difficult to cover.

A decoction—five minutes boiling—of a certain strength (a weak preparation will not answer) of a mixture of green and black teas (I have not succeeded so well with either alone, yet there can be no reason why one will not do,) after standing with the leaves for eight hours, disguises the taste of quinia and cinchonia sulphates, though not in so large proportion as coffee. For this purpose:

℞ Theæ V. gr. xxv,—Theæ n. gr. xxxiv, Aq. f℥iij.

LECTURE EXPERIMENTS.

By Prof. A. W. Hofmann.

Translated by Prof. Leeds from the Proceedings of the German Chemical Society, Berlin, Vol. 111, No. 12.

1. *Inflammation of hydrogen combinations in contact with fuming nitric acid.*

It is known through the investigations of Graham, that phosphuretted hydrogen, which has lost its spontaneous inflammability by contact with sulphur or in any other manner, acquires it again when brought into contact with nitrous acid. Phosphuretted hydrogen bubbles inflame, if a glass-rod moistened with hot fuming nitric acid be held over the surface of water out of which they are rising, When some drops of warm fuming nitric acid are poured into a cylinder of phosphuretted hydrogen gas, which does not ignite spontaneously, an extremely powerful and not altogether safe detonation takes place.

Sulphuretted and seleniuretted hydrogen are decomposed in the same manner by fuming nitric acid with the phenomena of ignition. But if the sulphuretted hydrogen contains a considerable quantity of free hydrogen, the combustion does not take place. It is well then in this experiment to prepare the sulphuretted hydrogen from native sulphide of antimony and not from sulphide of iron.

This phenomenon is most strikingly exhibited by hydriodic acid gas. When some cubic centimetres of moderately warm fuming nitric acid are poured into a rather large cylinder of hydriodic acid gas, immediately a great red flame bursts forth, which is enveloped in a violet cloud of iodine vapors. At the same time the inside of the cylinder is coated with a network of steel-gray crystals of iodine.

2. *Observation of complementary colors in looking upon a body with transmitted and with reflected light.*

Many colored substances, as is well known, show in reflected light the color which is complementary to that which they exhibit in transmitted light. This phenomenon is particularly beautiful in the case of the aniline colors, especially in the aniline green which is usually termed iodine green. Every one is familiar with the deep purplish red which the salts of rose aniline, when in solution, show by transmitted light. He less frequently has the opportunity of observing the magnificent cantharides green which the faces of large crystals reflect.

When a concentrated solution of iodine green in alcohol is evaporated in a glass evaporating dish in the air or, better, upon a water bath, the dish becomes coated with a homogeneous, quite transparent varnish, which shows in transmitted light a magnificent green color; in reflected light, on the other hand, a most highly characteristic, and, particularly after rubbing, a very decided red copper color.

When a part of the dish is gently warmed, the green changes into violet, since the di-iodmethylate of the trimethyl rose aniline is converted with liberation of iodmethyl into monoiodmethylate. Moreover, where the dish in transmitted lights appears of a beautiful violet, it shows now in reflected light a pure yellow brazen color.

While green and red on the one hand, and on the other blue and yellow may be taken in general as complementary colors, yet Prof. Dove has experimentally demonstrated in the above mentioned cases that the tints observed in the aniline dyes by transmitted and reflected light when combined produce white light.

The green and red colors, which the salts of rose aniline exhibit in reflected and transmitted light respectively, correspond to the complementary colors of a selenite plate of $\frac{1}{4}$ difference (Gangunterschied) looked at in polarized light through a doubly refracting prism as analyser.

The soft green color of iodine green in transmitted light, and the copper red, which this dye affords in reflected light, agree with the colors of a selenite plate of $\frac{2}{4}$ difference.

Finally the bluish violet color of the methylviolet arising from the iodine green by warming, and the brass color, which this substance reflects, are exactly comparable to none of the complementary colors which are given by the selenite plates in the rich collection of Prof. Dove. The colors occurring in the case of the last mentioned aniline dye lie in the middle between those observed in the observation of selenite plates of $\frac{3}{4}$ and those of $\frac{4}{4}$ difference.

3. *Tinctorial power of certain aniline dyes.*

The solution of a salt of rosaniline (since we are speaking here of very dilute solutions, it matters not which salt is employed) is diluted with water containing some drops of acetic acid, until it contains one part of dye to one million parts water (one milligramme to one litre water.) It possesses still a deep carmine red. A skein of silk moistened with dilute acetic acid is colored by this solution of a beautiful red in an instant. When the proportion of water is increased to 25

million parts ($\frac{1}{75}$ milligramme in a litre) the red color is still very plain, and silk immersed in the solution is colored light red in the space of a quarter of an hour. If the dilution is still further continued, it is shown that in case the proportion be 1 part dye to 100 million parts water ($\frac{1}{100}$ mgr. in a litre) the limit is attained to which the coloration is perceptible. Thin layers of this solution appear in fact quite colorless, and it is necessary to look through thicker layers (of about $\frac{1}{2}$ metre) or to observe the surface of the solution half in transmitted half in reflected light, in order clearly to recognize the tint. It is interesting to hang a thread of silk in a volume, not too small, of this almost colorless solution. After 24 hours the thread appears quite plainly and more deeply colored than the solution. In the light of this phenomenon we cannot doubt that in the bosom of the apparently tranquil solution there are currents, in consequence of which the colored water-molecules one after another pass over the thread at rest. The observations here made point to a vibratory movement of the molecules, such as philosophers are compelled to accept as a conclusion after proceeding upon different courses of reasoning.

If instead of the salt of rose aniline we experiment with one of its numerous derivatives, we observe a power of coloration quite similar. The experiment was tried particularly with aethyl-violet and with iodine green. In both cases the tint was perceptible up to a dilution of 100 million parts, and both solutions fixed upon silk after a long time a weak but perceptible color. Both of the last mentioned dyes are less suitable for this determination of limit to tinctorial power than the salts of rose aniline, since violet and green in the dilute condition lie near the colors, which are observed in looking through notable layers of pure water.

4. *Formation of nitric acid by the combustion of hydrogen in the air.*

It is well known that in the explosion of a mixture of hydrogen and air in the eudiometer, traces of oxides of nitrogen are always formed, and that merely by the burning of hydrogen in the air a little nitrogen is always oxidised. Lately I have observed this phenomenon under circumstances which make their communication perhaps not without value.

In case of a popular lecture the experiment of the formation of water should be performed on quite a large scale. To this end the two gases are brought together in a glass balloon of 10 litres capa-

city. The balloon is provided at both sides with tubulures through which glass tubes, ending in platinum tips, are carried. The water which is formed flows out of the neck of the balloon. In an experiment in which the air in the balloon had not been replaced by hydrogen, and the hydrogen had burnt for some moments in the oxygen circulating about it, and the first drops of water had run down into the flask placed to receive it, I was astonished to see the vessel filled with red vapors, the quantity of which increased when the corks which fastened the glass tubes in the lateral tubulures were momentarily closed. The smallest drops of the water running out reddened litmus paper; the solution plainly tasted sour, and gave with sulphuric acid and sulphate of iron the reaction of nitric acid.

In a trial, in which 30 grms. of water had formed within thirty minutes, the fluid was saturated with ammonia, and the solution was evaporated in a large watch-glass upon the water-bath. After cooling, an abundant crystallization of the characteristic needles of nitrate of ammonia made its appearance.

Finally it may be remarked that the apparatus which is here described illustrates exquisitely the process of formation of the water.

5. *Fluid Cyanogen.*

Cyanogen belongs to the easily liquefiable gases. At 20° four, and at 0° only 1½ atmospheres are necessary, in order to condense the cyanogen gas. At —21° the cyanogen at the usual atmospheric pressure is fluid, and in the neighborhood of the point of solidifaction of mercury it is solid. The phenomena of liquefaction is as easily observed in the case of cyanogen as it is in that of sulphurous acid.

Hitherto in lectures, when it was desired to show that cyanogen is liquefiable, the experiment has been performed either in a Faraday's tube, or in the well known compression apparatus of Magnus. The cyanogen is easily obtained in the fluid condition by both methods. But the quantity that is condensed is always very limited, and scarcely visible at considerable distances. Moreover the experiment loses much from the circumstance that the cyanogen cannot be allowed to stream out in the atmosphere, so that it can be recognized by its properties, its flame for example.

The ease with which condensed sulphurous acid can be preserved in vessels provided with glass cocks, gave the inducement to condense large quantities of cyanogen in strong glass tubes, to the mouth of which a Geissler's glass stop-cock was fused. It shortly became

evident that a glass cock was not necessary for this purpose, since it sufficed to connect a brass cock in the ordinary manner to a glass tube.

The mode of experiment which was finally adopted as the most convenient, is the following:

Upon an ordinary combustion tube of about 30 centimetres length, fused together at one end, a brass socket, into which a brass cock can be screwed, is fastened with sealing wax. In order to remove the air from the apparatus a thin delivery tube is passed through the open cock to the bottom, and a stream of cyanogen conducted in, until the gas which issues out of the opening exhibits a pure cyanogen flame. The delivery tube is then removed and the cock closed.

Two strong litre flasks, which are provided at the bottom with tubulures, serve as the apparatus for condensation. The two flasks are connected by an india rubber tube of 1½ meters length, which is sewed into a covering of linen. One flask is placed somewhat higher than the other, in such a way that when the one which is the lowest is filled to the neck with quicksilver, the mercury streams through the lateral tubulure into the flask which stands above. Into the neck of the flask which is filled with mercury a glass tube bent twice at right angles is fastened by means of a good cork, that is secured moreover by wire. This tube is then connected to a cyanogen apparatus. The latter is best made of a difficultly fusible tube, which is provided with a bulb for the reception of mercury. It is slowly heated in a combustion furnace. In proportion as the higher flask is lowered and the mercury flows out, the flask which held the mercury i filled with cyanogen.

After these preliminaries the condensation tube is placed for a quarter of an hour in a good freezing mixture (ice and common salt, to which some chloride of calcium has been added,) that has a temperature of —25°. The cyanogen apparatus is then removed, and the end of the exit tube is counected with the orifice of the condensation tube, the latter always remaining in the freezing mixture. This is easily done by means of a stout india-rubber tube, which is fastened moreover by means of cord. It is now necessary only to raise the lower flask and allow the mercury to flow into the one that is filled with cyanogen. As soon as the level of the mercury has reached the neck of the flask, the cock is closed and the tube is taken out of the ice.

Under the circumstances mentioned five centimeters of fluid cyanogen are obtained. On the opening of the cock the gas streams out with great violence. But the large peach-colored flame soon diminishes in consequence of the cooling of the liquid. This refrigeration is also shown by the coating of ice upon the exterior of the tube.

The condensed cyanogen remains unchanged for weeks.

6. *Alternate reduction and oxidation.*

Whoever is accustomed to heat the oxide of copper for combustions in a copper crucible over a gas flame, has undoubtedly observed the beautiful phenomena, which, in rapid alternation, take place upon the metallic surface. Ignited in the quiet flame, the under portion of the crucible exhibits the full copper color; but when a gentle draft of air draws the flame upon one side, it rushes through all the colors of the rainbow and is blackened in a moment. As soon as it is enveloped in the reducing flame it acquires its primitive metallic lustre.

The thought suggested itself that herein lay the germ of an experiment appropriate to the lecture-table. After many trials the following form has appeared best adapted to the end in view:

An iron ring is placed upon a triangle, in the middle of which a small brightly polished copper bell is placed. A powerful gas-burner, the flame of which touches the inside of the bell, quickly brings the metal to a glow. After some moments it is blackened. A strong stream of hydrogen is led by means of an india-rubber tube into a glass funnel, which is just of the proper size to cover the bell. At the moment when the hydrogen comes into contact with the metal, the oxidised crust is removed and the copper acquires again its primitive metallic lustre. If the funnel with its atmosphere of hydrogen be now removed, the incoming air immediately produces oxidation, the progress of which can be noted by the succession of the colors. When the bell is at glow-heat the phenomena of oxidation and reduction can be repeated ad libitum.

I was at first fearful that the superposition and removal of the hydrogen funnel might cause detonations, but I have never noticed the slightest disturbance.

The hydrogen which is employed in these experiments must be pure. The presence of sulphuretted or arseniuretted hydrogen alters the surface of the copper. The combinations thus formed are not decomposed by water, and the copper does not acquire again its beautiful metallic lustre until it is rubbed off with sandpaper.

ON A MORPHIOMETRIC PROCESS FOR THE PHARMACOPŒIA.

By William Procter, Jr.

The question, "What is the best process for assaying opium to determine its morphia strength, suited for adoption into the United States Pharmacopœia?" was accepted by the writer at the Chicago meeting.

Reflection on the query suggests that it is not so much what is the best analytical process, as to decide what process is best suited for practical use by druggists and pharmaceutists in determining the morphia value of opium for the purposes of the Pharmacopœia. Those who take the view that the process should embody the nicest and most refined manipulations of the analytical laboratory, may not accept this view, but when it is understood that a large majority of the persons needing its use are not analytical chemists, it is believed that simplicity, united to a fair degree of accuracy, is more available than extreme accuracy, beyond the reach of most apothecaries, applied in a complex process.

So many able chemists have published processes, some of which are well known in connection with their names, as Staples' process, Mohr's, Guillermond's, &c., that the ground would appear to be well examined. The process of Staples is that of the United States Pharmacopœia. Its point is in the employment of alcohol to retain the coloring matter in solution during the precipitation of the morphia, and in mixing the ammoniacal precipitant also with alcohol. The process of Mohr avails itself of the selective power of boiling lime-water to reject narcotina, and retain morphia in solution. Both of these processes extract the opium with cold water. Guillermond's process employs alcohol of 71 per cent. to extract the opium, which is then precipitated by ammonia. The precipitate, as in Staples' process, contains narcotina.

One difficulty in extracting the portion of opium soluble in water is the caoutchoucoid matter which tends to resist its solvent action. The idea of employing benzine or light coal oil to remove this, as well as the free narcotina, has been suggested by Albert E. Ebert for another purpose, and has been used by Dr. Flückiger in his examination of opium. It is believed that the preliminary use of this solvent in opium assays may be usefully adopted.

Believing that the best way to arrive at a solution of the query was

to try several processes with the same solution of opium, a sample of nearly dry opium, weighing 300 grains, was triturated to coarse powder, and then rubbed with repeated portions of water, until finely divided and macerated in six times its weight of water for twelve hours, then percolated on a filter until the washings were nearly colorless. The united liquids (amounting to 4500 grains) were divided into three equal portions, each representing 100 grains of opium.

No. 1. The solution was evaporated with moderate heat to half a fluid ounce, mixed with an equal bulk of alcohol (sp. gr. 835), filtered through a small filter, and the latter washed with a little diluted alcohol. 50 minims of solution of ammonia (sp. gr. 960) was mixed with 2 fluid drachms of alcohol. One-half of this was added to the alcoholic solution of opium with agitation, and allowed to stand six hours, when the remainder of the ammonia was mixed in and the vessel permitted to rest for twenty-four hours. The crystalline matter deposited on the interior of the vial being detached, the contents were at intervals poured on a small tared filter, and the crude morphia washed, first with diluted alcohol and then with water, dried at 120°, and weighed. The product was 9·75 grains. This was treated several times with boiling non-alcoholic ether, and the ethereal solution evaporated in a small-tared capsule gave 0·31 grains of crystalline prisms, equivalent to 0·31 per cent. of narcotina, and 9·44 per cent. of morphia in the opium examined.

No. 2. This portion was treated with solution of subacetate of lead till it ceased to be precipitated, the precipitate separated on a filter and well washed, the filtrate treated with diluted sulphuric acid by drops to separate the excess of lead as sulphate, and filtered. The clear solution by moderate heat is reduced to half a fluid ounce, mixed with its bulk of alcohol filtered, and the filtrate mixed with fifty grains of solution of ammonia containing alcohol, in two portions added half an hour apart, and allowed to stand twenty-four hours. The morphia was deposited in large distinct crystals, very few of which were attached to the interior of the vessel. They were collected on a filter, washed with diluted alcohol and water, dried and weighed 8.75 grains. This, repeatedly boiled in ether and the ethereal liquids evaporated, afforded but a trace of crystalline matter, too small to weigh and yet distinctly visible in minute prisms.

No. 3. This was mixed with sixty grains of lime, previously hydrated and boiled for fifteen minutes, the decoction filtered hot from

the dregs, and these well washed with hot water. The filtrate slightly acidulated with muriatic acid was evaporated to half a fluid ounce, mixed with its bulk of alcohol and filtered; an excess of alcoholic ammonia was added and mixed, and the vessel set aside for twenty-four hours. The colored crystalline powder and the portion attached as a crust to the interior, were carefully collected on a filter, washed, dried and weighed, affording ten grains of impure morphia, more colored than either of the other results.

The use of alcohol in this process is intended to retain the coloring matter, yet did not succeed in producing a light-colored morphia.

The last result, according to Mohr, should contain no narcotina, yet when boiled to exhaustion in ether deprived of alcohol, the ethereal liquid afforded 0·75 grain of narcotina, making the result of morphia 9·25 per cent., and narcotina 0·75 per cent.

It will appear, by a comparison of these results, that the Staples process, whilst less complicated than either of the others, yields a purer product than the Mohr process, and a slightly larger yield of morphia; whilst the process No. 2, which is suggested by the writer, affords the purest and best crystallized morphia, but is more complicated than either of the others. Hence, it is the first, or Staples' process, that is to be preferred, modified by treating the powdered opium with warm benzine as a preliminary operation. The final success is greatly aided by conducting the evaporation of the liquor at a moderate temperature, which renders the product less contaminated with coloring matter. By reducing the bulk before precipitation to the extent noted above, the precipitation of the morphia is facilitated, whilst the crystals are equally light colored. By using benzine beforehand the extraction of the opium will be more thoroughly accomplished.—*Proc. Amer. Pharm. Assoc.*, 1870.

THE PURGATIVE ACTION OF ALOES.

By T. and H. Smith.

In the 19th number of the *Pharmaceutical Journal*, there is published the report of a paper read by Mr. William Tilden, B. Sc., before the British Pharmaceutical Conference at Liverpool, entitled "A few Notes on Aloes."* In this paper Mr. Tilden gives some very valuable

* See page 34 Amer. Jonrn. Pharm., Jan. 1870.

information concerning the chemical properties of the drug, and we have much pleasure in bearing testimony to the ability of his researches, but, at the same time, we feel called upon to notice one or two points in his paper, on which we conceive his deductions to be erroneous.

He states that the active constituent of aloes is still unknown; that Robiquet first showed that the purgative property was not due to aloin; and he asserts that this latter substance is in complete disuse.

On these points we entertain entirely diverse opinions, and as the discoverers, and as far as we know the only manufacturers of aloin, we claim to some little knowledge of its chemical and therapeutical properties.

Mr. Tilden enumerates and describes four substances said to be present in aloes of the best quality, viz.:—

(1.) Aloetin, aloesin, amorphous aloin, bitter principle of aloes.
(2.) Crystallized aloin.
(3.) Resin.
(4.) Aloesic acid.

Of these four Mr. Tilden disbelieves in the existence of one, viz. aloesic acid, and adduces a reason why (3) resin should be related to the soluble portion of aloes. Of aloetin he remarks that it is very important as to quality, and there can be no doubt it is the product of the alteration of crystallized aloin. He regards it as a mixture of crystallized aloin, capable of recovering its crystalline condition in presence of water, and brown oxidized matter. We have many and various reasons for at present coinciding to some extent with Mr. Tilden in these remarks, but we are entirely at a loss to imagine to what substance he could attribute the purgative action of aloes, since he denies that aloin has any such effect, and yet concludes that aloes absolutely consists of that substance and products of its decomposition.

It is well known that the medicinal powers of aloes are not equal in different samples; that of two samples of the same variety, one may possess twice the purgative action of the other, and that when the varieties are different, the difference in medicinal value is in many cases even more marked.

The idea of an active principle is generally tenaciously associated with something such as strychnia or aconitia, of infinite power in small doses; but there are very many active principles, it must be re-

membered, the powers of which are not very many times greater than those of the drugs from which they are obtained, and in this present case, taking Mr. Tilden's results, he could not possibly expect that aloin would have more than five times the power of good aloes, inasmuch as he obtains more than 20 per cent. of the principle from the drug.

If it be admitted that aloin is the active purgative principle of aloes, one manifest advantage from using it would be that we have therein a medicine of unvarying strength, and we possess what we judge to be conclusive evidence that there is no other substance of value in aloes, and that in all cases where aloes of best quality will produce purgation, a proportionate dose of aloin will be of equal and more certain effect.

When Robiquet, in 1856, published his research on Aloetin,* he denied that that substance (which he seems to have supposed identical with aloin) had any purgative effect. At the time we contemplated publishing a denial of this, but the late Sir James Simpson happening to visit our works, we mentioned our intention to him, when he dissuaded us, observing that medical men were quite sufficiently convinced of the power of aloin, and that he frequently prescribed it and often took it himself, and with unvarying good effect. We could name very many other medical men, of undoubted eminence, who constantly prescribe it in preference to aloes, finding that it has in no case any ill effect, and that there is never any need to give an increased dose when its use is regular and long continued. Our own personal experience bear out these statements, and our commercial transactions give most emphatic testimony that the demand is not decreasing. Since its first discovery, our manufacture has increased from a few pounds to many thousand ounces yearly, and, although we have not arrived at Mr. Tilden's gratfying result of 20 per cent., yet, by recent improvements in our manufacture, we shall be able to produce it at about two-thirds its present price, aud we find the dose requisite to be aloin to aloes, as 1 is to 5. We should be happy to forward that gentleman a few doses for purpose of trial, should he wish it.—*Pharm. Journ., London, Nov. 19th,* 1870.

Edinburgh, November 12th, 1870.

* *Journal de Pharmacie,* tome xxix.

THE HONEY TRADE OF THE UNITED STATES, DOMESTIC AND FOREIGN.

By B. F. Stacy, Charlestown, Mass.

This article, which twenty-five years ago formed quite an insignificant article of trade in this country, is rapidly increasing year after year in domestic production; whilst the amount imported is growing smaller. While less is used for pharmaceutical purposes, it nevertheless is rapidly increasing in domestic use. It is also used largely by confectioners, and is an ingredient of many of the fancy beers which have recently become in vogue. Some dealers maintain that the honey which is the product of a cold climate is vastly superior to that of warmer latitudes, which seems almost a contradiction to nature, as Southern lands teem with flowers far excelling as a base of supplies to the bees. One sample that the writer saw from Canada excelled all others in whiteness, clearness and density. Samples from New York, Minnesota, Vermont and New Hampshire, ranked next in order. The only way to obtain pure honey is to buy it in the comb, as nearly all the strained honey sold in the market bears unmistakable evidence of adulteration; this is, however, so well known and so easily discovered that it is unnecessary for me to dwell on it, and as the adulteration is mostly sugar and occasionally a little starch, to give it a whitish appearance, it is at least *harmless;* would that all the adulterations now in use were equally so. Out of ten samples purchased of different dealers, eight of them gave plain evidence of having been tampered with, the remaining two being samples from Cuba, right from the custom-house.

"In 1860 the total product of honey of the United States, reported, was 23,366,357 pounds." "New York stood at the head of the list, with 2,369,751 pounds, followed in order by North Carolina, 2,055,969 pounds; Kentucky, 1,768,692 pounds; Missouri, 1,585,983 pounds; Tennessee, 1,519,390 pounds; Ohio, 1,459,601 pounds; Virginia, 1,431,591 pounds; Pennsylvania, 1,402,128 pounds; Illinois, 1,346,803 pounds, and Indiana, 1,224,489 pounds; all other States falling below 1,000,000 pounds." "Since the census of 1860 the statistics obtained have been partial and fragmentary; the statistics of Massachusetts for 1865 showed an increase of 26 per cent., and that of Iowa for same year an increase of 22 per cent. over the figures of 1860." "In the winter of 1868–69 the Department of

Agriculture sent out circulars to known apiarians in most of the states, and received returns from 489 counties in 32 states. The aggregate number of hives reported was 722,385." "Estimating for counties not reporting, and making due allowance for the fact that many of the counties reporting were giving special attention to bee culture, 2,000,000 of hives were deemed as low a figure as the returns would warrant. Allowing fifteen pounds of surplus honey to the hive (about two-thirds of the average reported), the total product in 1868 would be 30,000,000 pounds, which at an average valuation of 22½ cents per pound, would give $6,750,000." "In 1868 the quantity of honey imported was 212,176 gallons; value, $117,172; of which 90,452 gallons, value $50,569, were re-exported. A very small quantity of domestic honey was exported the same year. These figures show conclusively that an immense trade in honey has been built up in this country and is constantly increasing, which will eventually supersede all necessity of the importation of any from the West Indies." A small township in Minnesota reports 262 hives; from these hives 2826 pounds of surplus honey was taken in the season of 1869." When we consider that the cost of production is merely nominal, it will be seen that it pays to keep bees.

The writer respectfully acknowledges his indebtedness to the Commission of Agriculture, for the statistical information.—*Proc. Amer. Pharm. Assoc.*, 1870.

REMARKS ON RICININ.

By Richard V. Tuson, F.C.S.,

Professor of Chemistry in the Royal Veterinary College.

Among the "Chemical Notices from Foreign Sources" which appeared in the *Chemical News* of the 21st of October last, will be found an extract from an article entitled "On Ricinine and the Active Principles of Ricinus Seeds," published in the *Pharmaceutische Zeitschrift für Russland*, No. 1, 1870. This extract contained the following statement:—"As regards the ricinine of Dr. Tuson, prepared by the author (Dr. E. Werner) in large quantity, and according to Dr. Tuson's directions, it is stated that ricinine is not an alkaloid, and, moreover, a substance which contains a considerable quantity of ash; and the author, after carefully made analyses, comes to the con-

clusion that Dr. Tuson's ricinine is a compound of magnesia and of an organic acid, the formula of this body being—

$$C_{11}H_{20}O_{10}Mg_2+6H_2O.''$$

That the bodies obtained by Dr. Werner and myself from castor seeds are totally different, I hope to render evident in the present communication.

I have in my possession two small specimens of ricinine; one was prepared from the so-called castor-cake obtained from India, the other from castor-cake obtained from Italy. These specimens possess the undermentioned properties :—

1. Cautiously heated on a glass plate they melt and form a colorless mobile liquid, which, on cooling, solidifies into a whorl of acicular crystals.

2. Heated between two watch-glasses they sublime, apparently without decomposition.

3. Strongly heated on platinum foil, they first melt, then burn with a highly luminous flame, and *leave no ash.*

4. Heated with solid potassium hydrate, they evolve ammonia, proving that they *contain nitrogen.*

5. On estimating the amount of nitrogen by Péligot's method, the specimen of ricinine procured from Indian castor-cake contained 20·79 per cent., while that from Italian cake contained 20·39 per cent.

6. A solution of ricinine in hydrocholoric acid mixed with one of platinic chloride yields, on evaporation, well defined orange octahedra.

7. Cold saturated aqueous solutions of ricinine and mercuric chloride, if mixed together and allowed to stand, deposit fasciculi of acicular crystals.

A comparison of the foregoing epitomised account of ricinine with the description of the magnesium compound obtained by Dr. Werner from ricinus seeds, therefore clearly indicates that the two bodies are entirely different.

That ricinine is entitled to the appellation of alkaloid I hope yet to demonstrate by its complete investigation so soon as I shall become possessed of a large supply of castor-cake, now, I believe, on its way from Calcutta.—*Chem. News, London, Nov.* 11, 1870.

INDIGENOUS DRUGS.

By C. Lewis Diehl.

To write an article upon a subject that has not been completely investigated is, perhaps, the most unsatisfactory task imaginable, and this appears to be allotted to me in the present paper. When I accepted query 23, for 1868, I had no idea of the difficulties to be encountered in its proper solution. Apart from those of a purely personal character, I have met with the greatest difficulties in obtaining answers to inquiries from parties who could, if inclined, have given the desired information. Yet some little information has been obtained, which, however meagre, I propose to give in the following:

My sources of information are various. In some few instances I have received responses from those directly or indirectly engaged in the collection of indigenous drugs; but generally I have been obliged to depend upon that obtainable from wholesale dealers, to whom consignments had been made by parties doing business with them.

It is a remarkable fact, that our Louisville wholesale druggists depend upon the New York markets for their supplies of indigenous drugs, many of which abound and frequently are collected in our immediate neighborhood. Our retail dealers are supplied with limited quantities by several gatherers living among the range of hills in the neighborhood of New Albany, Ind., known as "the Knobs." Formerly there was a lively trade in indigenous drugs in New Albany; but such is not now the case, and the drugs gathered in its neighborhood find their markets no farther than our city. Our immediate neighborhood, on the Kentucky side, also contributes to our supplies through a few small gatherers, chiefly Germans; but taken altogether, our home supplies far from meet the demand of our retail trade, and generally bring better prices than those obtained from a distance. The drugs principally collected in our neighborhood—of which the largest part among the Knobs near New Albany—are: *Podophyllum*, *Leptandra*, *Caulophyllum*, *Lobelia*, *Cimicifuga*, *Gelsemium*, *Ulmus*, *Stillingia*, *Xanthoxylum*, *Phytolacca*, *Asarum Canadensis*, *Cornus Florida*, *Panax*, *Aralia nudicaulis*, *Aralia racemosa*, *Sambucus*, *Cataria*, *Mentha piperita*, *Hedeoma*, &c., and limited quantities of *Serpentaria*, *Spigelia*, and *Senega*. These abound also, and are collected in the counties of Shelby, Monroe, Brown and Morgan; and

one of our principal establishments has lately negotiated for a full line of indigenous drugs from Pembroke, Kentucky.

My information seems to indicate that the mountainous regions of Kentucky, especially Eastern Kentucky, contributes largely to the supplies of our Western dealers in indigenous drugs. From East Tennessee and Western Georgia large quantities may be and undoubtedly are obtained. Several years ago I had offers from a party in Chattanooga of quite a line of indigenous drugs. Where they find their market I am unable to say, but incline to the belief that the principal collections reach New York by way of Savannah, Ga. In many of the Southern States this branch of trade appears to attract considerable attention since the war, mainly in mountainous and swampy sections. In the neighborhood of Walhalla, South Carolina, quite a brisk industry has sprung up, and large shipments are made from there to New York, through the agency of Charleston firms. The drugs collected there may be enumerated in the following:

Panax, Senega, Cypripedium, Liatris spicata, Spigelia, Sanguinaria, Aralia nudicaulis, Aralia racemosa, Asclepias Syriaca, Asclepias tuberosa, Rumex, Podophyllum, Hepatica, Rhus, Rubus villosus, Cimicifuga, Marrubium, Stillingia, Spiræa ulmaria, Aletris, Convallaria polygonatum, Tussilago farfara, Phytolacca, Ulmus, Goodyera pubescens, Frasera Carolinensis, Arum, Solidago Odora, &c.

Occasionally, consignments of Senega, Serpentaria, and Spigelia reach our markets from Arkansas direct. Several years ago I purchased several bales of Senega and Spigelia, consigned to one of our wholesale houses from Ozark, Arkansas. It proved to be a poor investment, as the interior of the bales consisted largely of stems, and had to be garbled. The drug-gatherers of the Southern States being generally small farmers and negroes, make no regular profession of it, and only collect as their time permits. Hence the difference in the yield of these drugs between one year and another. They are disposed of by them to the nearest country storekeeper, who on his part consigns them to the wholesale dealer with whom he may happen to do business. I am told by reliable informants that the drugs collected in the Red River districts seldom reach our markets except by way of New Orleans and New York, and that when they do reach us direct, they are generally inferior in quality. One of our principal wholesale drug-houses buys its supplies of indigenous drugs exclusively from a New York firm, and nearly all of the others depend

upon the same firm when they cannot obtain bargains nearer home. When first making inquiries regarding the collection of indigenous drugs, I met with the invariable response, "*Inquire in New York.*"

Regarding the method of collecting and preparing the drugs for market, I can give you but little direct information. I have before me a circular addressed to drug-gatherers by one of our principal Western dealers in indigenous drugs, from which I extract the following:

"Most medicinal roots are perennial (that is, the roots continue more than two years, whether the leaves continue or not), and should be gathered any time between maturity or decay of the leaves or flowers, in the summer or fall, and the vegetating of the succeeding spring. Biennial roots, or those that live but two years (like burdock and yellow dock), should be collected of the growth of one year—any time between September and the time they commence running up to seed in the following spring.

"Barks should be gathered as soon after they will peel in the spring as possible, and all the moss carefully removed. It is usually best to fell the tree and remove the moss while the bark is on the tree.

"Leaves and herbs should be collected just before they mature, and before they begin to fade; the stems and stalks rejected, as when dry they are a hard woody substance, nearly inert.

"Flowers when they first open; and

"Seeds just before they are quite ripe, as they, like leaves and flowers, ripen after being gathered.

"Roots should be thoroughly cleansed from dirt and foreign substances, and if large, like Indian turnip, &c., sliced.

"All the above articles should be dried; the sooner the better. For the first few days it is best to expose them to the sun and air, avoiding any dew or dampness; then spread around on floor and shelves, watching them to see that they do not heat by being piled too thick, till nearly dry. Most roots require from three to six weeks to dry sufficiently to be safe.

"For shipping, it is best to pack them hard in coffee-sacks or large gunnies and burlaps; the next best is good flour barrels."

These circulars appear to be distributed with great circumspection among herb-gatherers and country stores throughout the Southern and Western States, and in all probability serve as a guide to the gatherers. The few gatherers with whom I have been able to converse

personally, proved very slow to give information, but from their conversation I judge that they preserve their collections on the general principles above specified.

It is a matter of sincere regret with me that I have been unable to do more than the foregoing towards the solution of Query 23, for 1868; but I feel sufficient interest in the question not to let it rest where it now stands, and shall do all in my power to give a better answer at the next meeting of the Association.—*Proc. Amer. Pharm. Assoc.*, 1870.

ON THE INFLUENCE OF CARBONATE OF AMMONIA UPON SULPHATE OF STRONTIA AND SULPHATE OF BARYTA.

By J. Reinsch.

Equivalent quantities of carbonate of ammonia and sulphate of strontia (cœlestin) with the requisite quantity of water, were put into a flask and set aside at ordinary temperature; in a short time small bubbles of gas were observed and a fine white powder deposited upon the bluish cœlestin. The mixture in another flask, prepared in like manner with carbonate of ammonia and sulphate of baryta (heavy spar) likewise evolved gas, and the liquid became turbid. After standing for eight days at ordinary temperature, the contents of both flasks were digested at a temperature of 60° C. (140° F.), when carbonic acid gas was copiously evolved, which from the strontia mixture had a peculiar odor of horse-radish.

After the cœlestin had been entirely converted into a white powder, the liquid, now almost free from odor, was filtered off and proved to be a solution of sulphate of ammonia, while the insoluble portion consisted of carbonate of strontia with a little silica and alumina. The sulphate of baryta had been converted into a much softer snow-white powder of the same composition, and the liquid was free from sulphuric acid. Though carbonate of baryta seems to have been formed, this was instantly reconverted into sulphate.

The author recommends this method of separating, for analytical purposes, the alkaline earths by converting them into sulphates and digesting these compounds with carbonate of ammonia, when lime and strontia, having been converted into carbonates, may be obtained in solution by dilute acids, while sulphate of baryta is left behind.—*N. Jahrb. f. Pharm.*, 1870, *July* 11–13. J. M. M.

ON GLYCYRRHIZIN.

By Joseph M. Hirsh, of Chicago.

What is the easiest and most practicable method of isolating glycyrrhizin; to what extent does it possess the power of masking bitterness; and what is its mode of action?

The mode of preparing glycyrrhizin, mentioned in the last Dispensatory, of precipitating the same from a cold infusion, I found highly impractical, on account of the slight solubility of the same in cold water. Berzelius's method of preparing it from sulphate of glycyrrhizin gave but a dark-colored product, difficult to purify, while Vogel's method of preparing a plumbate of glycyrrhizin, and subsequent decomposition with hydric sulphuret, is rather laborious. The best practical process appeared to be the preparation from an infusion made with *boiling* water of acetate of glycyrrhizin, which upon evaporation to dryness is dissolved in alcohol, when the acetic acid is neutralized with soda, the new salt crystallizing out, while the glycyrrhizin remains in solution. Another method, giving good results, I found to be the preparation of an alcoholic extract by percolation, which I heated to the boiling-point, filtered off from the deposit produced, when I evaporated nearly to dryness, redissolved in alcohol, from which solution it remained behind almost pure upon evaporation.

Experimenting with this product in regard to its relation to masking bitterness, I found one part to cover up the bitter taste of four parts of Epsom salts, a slight addition of the latter being plainly perceptible, although by no means as disagreeable as when tasted alone. Of an alcoholic extract of coffee, an amount representing twenty parts of coffee, lost its bitter taste upon the addition of the glycyrrhizin. A number of other experiments of similar kind were made, but your reporter respectfully expresses his doubts about the *mathematical* reliability of results, arrived at by taste alone, and confines, therefore, his remarks to the *modus operandi* of the glycyrrhizin.

Taste being an effect upon the nerves of sensation (of taste), the change of taste can be produced either by a chemical change of a substance, or by a peculiar local affection of the nerves of taste. The first case, as might have been anticipated, with Epsom salts, does not occur, the glycyrrhizin not affecting the sulphate of magnesia in any way.

The second supposition then lay near, namely, that the nerves were rendered insensible to the bitter taste. This might be done by an

organic change of nerve-matter, or by the interposition of a foreign body between the nerves and the bitter substance. To ascertain the former lay beyond the facility of your reporter, and I made, therefore, the best of the last supposition, which seems to give a true solution of the problem. When glycyrrhizin or liquorice dissolves upon the tongue, the latter soon becomes furred, coated, this coat being a coagulum of the albumen of the saliva with the glycyrrhizin. A few tests convinced me that even a weak solution of albumen coagulates readily with glycyrrhizin, and I took the artificial coating of the nerves produced by the albuminous coagulum of glycyrrhizin to be the true cause of its masking bitterness. If this was true, other substances, which readily coagulate albumen, should produce the same result.

With this idea I tried a solution of carbolic acid with various bitter substances, and in each case the bitterness was annihilated if the quantity of carbolic solution was sufficient. But while glycyrrhizin and its compounds are sweet, this is not the case with carbolic acid, the taste of which replaced that of the bitter substance with which it was mixed, this taste being in itself not agreeable. To remedy this evil carbolate of glycerin was tried with marked success. Epsom salts, coffee, absinthe, &c., lost their bitter taste when mixed with a sufficiency of carbolic glycerin.—*Proc. Amer. Pharm. Assoc.*, 1870.

SUMBULUS MOSCHATUS.

Inspector Lungershausen of Moscow, reports in No. 27 of Wochenschr. f. Gärtnerei und Pflanzenkunde, that the hitherto unknown plant yielding musk, or sumbul root, is now in bloom in the botanical garden at Moscow. When the Russians occupied Bucharia, the plant was discovered and several roots were sent to Moscow, of which but one arrived in good condition. This new umbelliferous plant it was hoped would produce fruit and thus be propagated in Europe. The root has been used in Russia with considerable success in Asiatic cholera.

Professor C. Koch regards the plant as a very interesting one, on account of the strong musk odor of its root, and because the musk deer lives in the same regions. The root has been known for about thirty-five years, without, however, sustaining the high reputation it has gained in Russia, so that it belongs already to the obsolete remedies. It is now mainly employed in perfumery in place of the high

priced musk. There may, possibly, be two musk roots, both indigenous to Central Asia, one being exported through Russia, the other from the East Indies.

The musk root contains about 9 per cent. of a soft oleoresin, obtainable by ether, which in contact with water has the odor of musk. It contains a peculiar acid, sumbulic acid, which appears to differ from angelicic acid and from umbelliferon. It has been long known that the root belongs to an umbelliferous plant; flowers and fruits have sometimes been found with it. The latter differing from those of other umbelliferæ, were made the type of a new genus, and the plant was named *Sumbulus moschatus.—Hager's Ph. Centralhalle* 1870, *No.* 39, 367, 368. J. M. M.

ON THE ARTIFICIAL PREPARATION OF MANNITE.

By Joseph M. Hirsh, of Chicago.

Query 8.—The relation of mannite to glucose in composition is very close. Can mannite be prepared artificially? and if so, how? And has it the same physiological properties?

The preparation of artificial mannite, attempted at the instance of this honorable body, has been but a partial success, in so far as I could not in every instance obtain a product of exactly the same composition from the raw material, commercial glucose. Trials with pure grape-sugar invariably failed, in my hands, to produce that peculiar nauseous principle characteristic of manna.

For the sake of brevity, I shall mention the outlines of my experiments in this direction.

I made glucose in the usual manner from starch, leaving about ten per cent. of dextrine in the same undecomposed, but did not concentrate the glucose more than to 15° Beaumé. To this solution I added five per cent. of wheat flour, five of molasses, and as much of common malt vinegar, when the mass was at a temperature of 100° F. In twenty-four hours a lively fermentation had set in, which continued for three days, when I concentrated the liquid, which then showed the peculiar nauseous taste and odor of manna. Digested with alcohol, mannite dissolved, crystallizing upon evaporation of the alcohol, while dextrine and other impurities remained behind undissolved.

The peculiar nauseous principle appears to be partly decomposed matter, undergoing a gradual change into humus. Whoever has been

in a vinegar factory, badly conducted, where poor ventilation produces an incomplete oxidation of the alcohol, but rather decay, must at once be struck by the resemblance of this odor to that of manna. It was this experience which induced my experiments in the manner mentioned above, the gluten of the wheat flour forming, together with the vinegar, an excellent ferment of putridity, which not only produces the nauseous, humus-like parts existing in manna, but also the molecular change of cane and grape-sugar, which converts it into mannite.

This artificial manna, in its action as a laxative, equals the true manna, and very likely the presence of a substance in a state of change, the active principle, is the same in both the true and the artificial manna. The mannite produced in this manner does not reduce alkaline cupric tartrate, showing the complete change of the glucose; but your reporter would beg leave to complete his researches, viz., on the elementary analysis of the artificial product, which pressure of business has prevented him from completing.

An accompanying sample of the manna produced will show how far my attempts have been successful.—*Proc. Amer. Pharm. Assoc.*, 1870.

ON SOLUTION OF GUAIAC RESIN FOR MEDICINAL USE.

By James T. Shinn, of Philadelphia.

Query 7.—What is the best and most eligible liquid form for the preparation and administration of guaiac resin?

There are two officinal liquid preparations of guaiac, the tincture, and ammoniated tincture, both of which are perfect solutions of the drug, but are very disagreeable in taste when given alone, or even when diluted with four or five parts of water. The great desideratum is to find a menstruum which is a good solvent, readily miscible with water, and palatable; and although unsuccessful in this attempt, I will give some results of the experiments made.

Alcohol dissolves all the resinous portions of commercial guaiac, leaving from 20 to 25 per cent. of impurities, chiefly chips of the wood and sand, and the purified guaiac obtained by evaporating the alcohol from this solution is readily dissolved by its weight of that fluid. The officinal tincture (three ounces to a pint), will bear an equal volume of water or syrup and remain clear, and is miscible in any proportion with glycerin and liquor potassæ without producing turbidity.

Thinking a reduction in the amount of spirit might be an advantage, the following formula was tried:

Take of Purified Guaiac,	℥ij.
Alcohol,	f℥iiij.
Solution of Potassa,	f℥ij.
Glycerin,	f℥xj.

Dissolve the guaiac in the alcohol, and add the solution of potassa and glycerin.

This forms a clear and permanent solution, of pleasanter taste than the tincture when given alone, but when mixed with water producing about the same turbidity, and leaving the same acrid taste in the fauces. Glycerin does not mask this acridity as well as sugar, but the substitution of part syrup produced a precipitate of the resin.

Decidedly the most agreeable manner of administering guaiac in liquid form, so far as tried, is that of a syrup prepared as follows:

Take of Guaiac,	℥j.
Solution of Potassa,	f℥ss.
Sugar,	℥xiv.
Water, sufficient.	

Macerate the guaiac in the solution of potassa mixed with f℥ij of water for two or three days; then percolate with water till eight fluid ounces of liquid are obtained, in which dissolve the sugar.

This syrup is quite pleasant to the taste, and can be taken alone or mixed with water; it has been prescribed for several years by Dr. Ludlow, of Philadelphia, with decided benefit in cases of rheumatism, and can be given for a long period without exciting disgust.

The quantity of solution of potassa may be doubled without rendering the syrup unpalatable, and thus would increase the amount of guaiac dissolved.—*Proc. Amer. Pharm. Assoc.*, 1870.

TEST FOR CHLORIC ACID.

By M. R. Bœttger.

Three years ago, M. Braun described an extremely delicate test for nitrates and nitric acid; it depended upon the intense red coloration produced by these bodies upon sulphate of aniline dissolved in sulphuric acid. M. Bœttger suggests the same reaction for the detection of chloric acid and the chlorates. The smallest possible trace of a chlorate introduced into the solution of sulphate of aniline in sulphuric acid will develop almost instantaneously a blue color throughout the mass.—*Journ. de Pharmacie et de Chimie*, from *Jour. Ph. Lon.*

SP. ÆTHERIS NITROSI, B. P.

By Alfred E. Tanner.

Read at a Meeting of the Liverpool Chemists' Association, Nov. 27, 1870.

The process in the B. P. is the one usually known as Redwood's; it consists in distilling a mixture of rectified spirit, nitric and sulphuric acids, together with copper wire, at a certain temperature, in a glass retort, furnished with a thermometer; and in operating on the Pharmacopœial quantity, 15 fluid ounces are ordered to be drawn over, and this distillate is to be mixed with 40 fluid ounces of rectified spirit, or a sufficiency, so that the mixture may correspond to the tests for sp. gr. and percentage of $C_2H_5NO_2$, this latter being determined by means of a saturated solution of Ca Cl.

Now I have followed this process for the preparation of spiritus ætheris nitrosi ever since the Pharmacopœia was published, but have never succeeded in collecting the amount of distillate there ordered; on no occasion have I been able to produce more than about 11 fluid ounces, excepting by the addition of more nitric acid than the Pharmacopœia allows, and then the product has been too rich in nitrous ether.

I have usually found this 11 fluid ounces of distillate to contain 50 per cent. of $C_2H_5NO_2$; that is, it will show a separation of 42 per cent. when agitated in a graduated tube with double its volume of saturated solution of a Ca Cl; this, then, appears to contain the whole amount of $C_2H_5NO_2$ required, viz., about 5½ fluid ounces, or 36·6 per cent. of the quantity ordered by the Pharmacopœia to be drawn over, and on mixing this with four times its volume of rectified spirit, the mixture corresponds exactly with the spiritus ætheris nitrosi of the Pharmacopœia, showing 10 per cent. of $C_2H_5NO_2$ by the CaCl test, and having a sp. gr. ·846.

I should mention that this 11 fluid ounces of distillate was produced within the limit of temperature ordered, viz., 180°, but by increasing the heat to 200° there was no difficulty in distilling about 4½ fluid ounces more, but that appeared to consist principally of spirit; it was not acid when first distilled, but became so in a few days. On the last occasion of preparing sp. æther. nitros., I made a few notes which may, perhaps, be interesting to some.

The quantities operated upon were those mentioned in the B. P.,

viz., sp. vini. rect. Oj. acid nitric 3 fluid ounces, acid sulphuric 2 fluid ounces, and copper wire. These ingredients (with the exception of ½ fluid ounce of the nitric acid which was set aside to be added subsequently), were put into a glass retort, and the mixture distilled at a temperature commencing at 160° and rising to 175°. The nitrous ether began to form at 160°, which is 10 degrees lower than the point indicated in the Pharmacopœia; when the temperature has risen to 175° and about 8 fluid ounces had passed over, the boiling ceased, and no more could be distilled without exceeding the limit of temperature, viz., 180°; so the contents of the retort were allowed to cool somewhat, and the remaining ½ fluid ounce of nitric acid was added; the distillation was then continued as before and 3 fluid ounces more passed over, making together 11 fluid ounces; a fresh receiver was adapted to the apparatus and the contents of the retort heated to 200°; the distillate thus produced measured 4½ fluid ounces, and consisted chiefly of spirit; it was nearly neutral to test paper, and had very little flavor of nitrous ether, its sp. gr. was ·867. I further distilled the contents of the retort until a temperature of 220° was shown; this produced about 2 fluid ounces more of a liquid, chiefly spirit and water, having a sp. gr. ·897; this was also neutral, but had a disagreeable odor. The 11 fluid ounces of distillate above referred to was then examined and found to have a sp. gr. ·881, and showed by the CaCl test a separation of 42·5 per cent., thus corresponding to 50·5 per cent. $C_2H_5NO_2$. This agrees tolerably well with the calculated sp. gr. of a mixture of equal parts of rectified spirit (·838) and nitrous ether (·900), which gives ·870 as a mean; the difference between these numbers may, I think, be accounted for by the condensation which takes place on mixing.

These considerations, I think, show that there is more spirit used in the first part of the process than is necessary, or what amounts to the same thing, too little nitric acid. I think a proportionate increase of nitric acid should be used, and the distillate tested as to the amount of $C_2H_5NO_2$ it contains, and if, as in the case just mentioned, it is found to contain 50 per cent., then 1 volume mixed with 4 volumes of rectified spirit would furnish spiritus ætheris nitrosi of the Pharmacopœia strength.

On the question of keeping this compound I regret having no suggestion to offer. It seems inherent in the nature of nitrous ether, even when pure, to change rapidly, becoming strongly acid after being

kept a few days. Doubtless the keeping properties of sp. nitr. are in direct proportion to its strength in ether. A 5 per cent. solution is, I think, more desirable than the present strength, and it would approach nearer to that usually sent out by the wholesale houses. I have reason to believe it is never sent out of the strength ordered in the B. P.

The only possible remedy to prevent this decomposition that I can conceive may be the introduction of some other substance which will exert a preservative influence over it. I have not made any experiments in this direction, but they are well worthy our attention. Some organic substance, such as C H Cl_3, might possible be of use. I see acetic ether recommended in one of the American Journals of pharmacy, but can say nothing of it from experience.

Before concluding, I should like to say a word or two of a practice which I consider highly reprehensible. Most of the wholesale houses, I believe, send out what they term solutio ætheris nitrosi 1 to 7 for the purpose of making sp. æther. nit., and doubtless the confiding pharmacist considers he has got hold of a most convenient article for making this otherwise uncertain preparation. I have even heard of its being used in the proportion of ʒj for every ℥j of spiritus ætheris nitrosi ordered and trusting to the other tinctures ordered in the mixture to make the requisite amount of spirit. I had occasion the other day to examine a sample of this preparation procured from a respectable wholesale house. It was received in a stoppered bottle covered with yellow paper, on the label of which were the words "Solut. ætheris nitros. 1 part added to 7 parts of sp. vini rect. (56 per cent.) forms the sp. ætheris nitrosi of the British Pharmacopœia." Thus, its pretensions were very explicit indeed, informing you of the strength your spirit ought to be, and also exactly defining what the mixture would be when made. Now, as the label contained no special precaution for keeping and storing this solution, I was rather doubtful of its assertions, for a solution of this strength ought to contain 80 per cent. of $C_2H_5NO_2$; and as $C_2H_5NO_2$ boils at about 65° F., this solution must be very dangerous to store, especially in summer, and unless some special precautions were adopted; but I soon found there were no fears to be entertained on this account. The sp. gr. was found to be ·857, and the separation by the CaCl test about 3 per cent., thus corresponding to 11 per cent. of C_2H_5NO instead of 80, or 1 per cent. above the strength of spirit æth. nit. of the B. P. Now,

as this article is usually charged from 5*s.* to 6*s.* per ℔, you will see how large a price we sometimes pay for our credulity. We ought not to allow ourselves to be imposed upon in this manner. The process of the Pharmacopœia is neither expensive nor difficult, and I strongly advocate making this and other preparations for ourselves, or, when this is not practicable, to subject them to strict examination before taking into stock. I have great suspicions of many of these concentrated preparations, and doubt not that, could they all be examined with the same facility as this one, many would be found very deficient. —*Pharm. Journ., Lond., December*, 10*th*, 1870.

THE REACTION BETWEEN IODIDE OF POTASSIUM AND SUB-NITRATE OF BISMUTH.

By W. Bathurst Woodman, M. D., and C. Meymott Tidy, M. B.

An out-patient attending at the London Hospital was taking the bismuth mixture of its Pharmacopœia, when it was thought advisable to add iodide of potassium to the previous prescription. When she came the following time, she appeared much alarmed at a red precipitate in the mixture, which she supposed to be "red lead" purposely put in by some neighbor, the sediment having been almost colorless when she reached home. As no mention is made in the ordinary text-books of Materia Medica of the decomposition which takes place, although it is doubtless well known to metallurgists, it occurred to the authors to examine the reaction a little more closely. The change takes place slowly, and appears to consist in the formation of an iodide of bismuth, potassic nitrate remaining in solution. This iodide of bismuth is a dark red substance of cubic form, and seems to be a simple iodide, which is almost insoluble both in water and in excess of potassic iodide. Some of its properties are curious. It is a very insoluble substance; for, in addition to what is mentioned above, we may add that saturated solutions of chloride of ammonium, chloride of sodium, ferrocyanide of potassium, and corrosive sublimate, do not dissolve it in any appreciable proportions. Acetic acid dissolves it slightly, without effervesence. On boiling with liquor potassæ or ammonia, the hydrated oxide of bismuth ($H Bi O_4$) is produced, which is insoluble in excess of either reagent. On treating this iodide with strong nitric acid, there was active effervescence; fumes of iodide being

given off, a blackish, metallic-looking substance being left, entirely soluble in spirit, which proved to be pure iodine. Acid nitrate of bismuth remained in solution, which was not precipitated by a small quantity of water, or until neutralized. With hydrochloric or sulphuric acid there was no effervescence, but iodine was again precipitated; with the latter some iodic acid was formed. Oxalic acid also decomposed the salt, setting free the iodine; the action being somewhat slower than it was in the case of the minerals acids.

A few trials of it in doses of 5 to 20 grains appear to indicate that it is not an energetic therapeutic agent, which is probably to be ascribed to its comparative insolubility.—*British Medical Journal.*

ON IVA (ACHILLEA MOSCHATA.)

By Dr. A. v. Planta-Reichenau.

The plant is known in Switzerland as forest lady's herb (Wildfräulein-Kraut) and has been used there for centuries as a stomachic tonic, &c.

The author collected the herb before flowering without the root. It was, in the form of a coarse powder, distilled with steam, until volatile oil ceased to come over, and the aqueous decoction evaporated to the consistency of an extract. The herb thus exhausted with water, was dried and extracted with alcohol until it ceased to impart to it a bitter taste; most of the alcohol was distilled off.

Iva Oil. The crude volatile oil is bluish green, of a peculiar, not disagreeable odor, and a taste reminding of peppermint. It commences to boil at 170° C.; the greatest portion distils between 180 and 210° C.; the distillate between 230 and 260° C. is brown, and has the odor of wormwood. A dark brown, soft resin is left behind, which is not bitter, insoluble in absolute alcohol, but readily soluble in ether and oil of turpentine. The rectified oil was of a faint yellowish color, an agreeable refreshing odor, and a warm bitter taste, reminding of peppermint. Its composition is $C_{48}H_{40}O_4$; the author names this ivaol.

Ivaïn. The dark green alcoholic liquid was precipitated by alcoholic solution of acetate of lead; the filtrate was treated with sulphuretted hydrogen and the filtrate evaporated; the residue was washed with acetic acid until the washings were colorless, afterwards with water, until it floats upon it. It was then repeatedly dissolve

in alcohol and evaporated, to remove acetic acid, then treated with animal charcoal and the alcohol evaporated. Ivaïn = $C_{48}H_{42}O_6$ has the consistency of Venice turpentine, is of a yellow color, insoluble in water, and in alcoholic solution has a persistently bitter taste.

Achilleina. The aqueous extract was triturated with alcohol until it ceased to become colored; the alcohol was distilled off and the residue precipitated by water. The precipitate having been washed with water, the aqueous liquid was agitated with plumbic hydrate to remove acids. The filtrate was freed from lead, evaporated and alternately dissolved in absolute alcohol and in water, and evaporated until the achilleina yielded clear solutions with both liquids. Thus prepared, it has an alkaline reaction, is brown red, amorphous, friable, very hygroscopic, readily soluble in water, with more difficulty in absolute alcohol, insoluble in ether; its odor is peculiar, its taste very bitter but not disagreeable. The author isolated also the bitter principle from Achillea millefolium, which had been obtained by Zanoa in a not entirely pure state, and found it to be identical with achilleina. Composition = $C_{40}H_{38}N_2O_{30}$. The salts have not been investigated.

Moschatina. The precipitate obtained by water, in the concentrated alcoholic residue, was taken up by absolute alcohol, evaporated to dryness and treated with water until the mass became pulverizable under water. It is of an aromatic bitter taste, little hygroscopic, barely soluble in water, fuses under water upon the water-bath, and separates from its solution in hot water in a pulverulent condition. Composition = $C_{42}H_{27}NO_{14}$.

Achilletin. On boiling achilleina for several days with diluted acids sugar is formed, together with a volatile aromatic principle and probably ammonia, and a dark-brown powder separates which is not bitter, insoluble in water, sparingly in alcohol, and in this solution has an aromatic taste. Composition = $C_{22}H_{17}NO_8$.

The author also obtained stearic acid on cooling the tincture of iva, concentrated by distillation.

The aqueous solution of the ashes contained very little sulphate of lime and magnesia, but considerable alkalies and chlorine. Nitric acid dissolves from the residue carbonates, much lime, also phosphoric acid and little magnesia. The undissolved portion consisted of charcoal and much silica.—*Annalen der Chemie und Pharmacie*, 1870, *August*, 145—161. J. M. M.

SULPHUROUS ACID.

The value of sulphurous acid gas as a disinfectant has been established by many and crucial experiments, and is generally admitted. This agent is specially recommended by medical officers of health. There is a want of convenient methods of applying it, and especially of applying it in a limited space and to a definite and measured degree. Mr. John Gamgee has called attention to the convenience of employing it as disengaged from an alcoholic solution. Cold alcohol will, he states, take up three hundred times its bulk of sulphurous acid gas. Where, for example, it is desired to saturate a box of clothing with this gas, it is sufficient to drop a certain quantity of its saturated solution in alcohol into the floor of the box, and a large definite quantity is set free by the evaporation. The suggestion is one of importance, and seems to us worthy of attention. The solution of sulphurous acid in alcohol could easily, and probably with advantage, become a general article of pharmaceutical commerce for medical and sanitary use.—*Pharm. Journ. Lond., Dec.* 10, 1870, from *British Medical Journal.*

TINTED HONEY.

A specimen of rose-colored honey has been presented by Messrs. Fortnum and Mason to the Food Department of the South Kensington Museum. It is of great beauty and delicacy. The comb is virgin, the wax almost white, the honey limpid, pure and of the color of pale red currant jelly. The secret of its production is not revealed, except that it is the result of artificial feeding. The *Gardeners' Chronicle*, after alluding to the various opinions held as to the change which honey undergoes between the time of its being taken from the nectary and that of its being deposited in the comb, remarks that honey from white clover has a greenish-white hue, that from heather a rich golden yellow, and no doubt other colors might be observed according as certain flowers are in particular abundance. It is even possible that feeding the bees upon currant or raspberry jelly or jam would answer the purpose equally well. But it is clear that this step in the refinement of honey being reached, we shall not stop here. With the help of the chemist, the beekeeper will be able to turn out, in a few weeks, to order, honey of any hue, blue, pea-green, orange, or apricot-colored, or even,—by a little ingenious manipulation of the present system of hives, which will allow of any part of the comb being shut off or made accessible to the bees at pleasure,—a parti-colored honey, arranged in artistic patterns and devices.—*Pharm. Journ., Lond., Jan.* 7, 1871.

Minutes of the Pharmaceutical Meetings.

The Pharmaceutical meetings were again resumed, after several years' intermission, on the 18th of October, 1870. At the meeting held in the College hall this date, there were present several of their originators. Dr. W. H. Pile acted as Registrar or Secretary until there should be one elected to serve for the ensuing year. A ballot was next ordered, and Clemmons Parrish was elected to fill that position. A vote of thanks was tendered to Dr. Pile for the able manner in which he had filled the position of Registrar, also for the uniform and untiring interest he has always manifested in these meetings of the College.

Dr. Pile presented to the College accurately graduated minim and pint measures of his own making.

It was stated that the object of this meeting was more especially to consider the best mode of conducting our future gatherings, that those participating may derive the fullest benefit from them; that all may have something beside the benefit derived from social interchange of ideas. The Registrar was authorized to publish notice of meetings in the "Public Ledger," also to give a wide circulation to cards of invitation. He was also requested to invite the class now attending lectures in this hall.

The following committee was appointed to furnish a plan for conducting these meetings: Israel J. Graham, Prof. Maisch, and Dr. Pile, to report next month.

Prof. Maisch exhibited a specimen of the so-called African saffron, obtained from Chicago. Upon examination, this proved to be Carthamus, much broken and discolored. Also a sample of gum sennaar, a species of Acacia, at about two-thirds the price. This gum comes into commerce *via* Trieste, from a port on the Red Sea. Externally it resembles a good quality of true gum Arabic, forms a mucilage which is not so bland as that produced from true gum. This may be distinguished from the Acacia Vera by the following characters: A mucilage from true gum with Goulard's Extract produces slight opalescence. A mucilage from gum sennaar filters slowly with milkiness; the addition of aqua ammonia to the filtrate of these, in the case of true gum, in 24 hours a slight opalescence is found, whereas in the filtrate from gum sennaar with ammonia is a gelatinous mass in the same space of time.

At the meeting on November 15th, the order of business was as at meetings generally. The Committee appointed at last meeting reported the following suggestions:

1st. As it is of primary importance that a general interest should be felt or created in the attendance of these meetings, the Committee would recommend that an earnest invitation be extended to the members of the College, and all others who may desire to participate in the proceedings, to produce at each of our meetings either written or oral contributions on subjects pertaining to chemistry or pharmacy, or the commercial relations of drugs. Upon the con

clusion of such communications, the presiding officer of the meeting to call for any remarks that may be elicited by the subject thus introduced.

2d. That there should be appointed annually a Standing Committee, consisting of three members, whose duty it should be to propose subjects for discussion at any of our meetings, whenever there shall be a lack of material voluntarily contributed by members.

3d. That a box or other suitable arrangement be provided for the reception of written queries, anonymous or otherwise, which members may desire to propound, relating to any subject connected with the shop or laboratory; which queries may be taken up for discussion either at the meeting in which they are proposed or at a subsequent meeting.

4th. That this Committee be requested to obtain, from time to time, the services of any who may favor the meeting with lectures suited to the occasion.

These recommendations were adopted in parts and as whole. The Committee appointed for the ensuing year was Charles Bullock, Dr. Pile, and Prof. Maisch.

Dr. Bridges exhibited a specimen of marked glass cut by a new process, in which sand is blown with great force against the glass, certain portions of which is protected by wire of different shape, or by gauze or lace, the figure of which is left on the smooth glass surface, while the meshes are etched by the attrition of the sand. Wherever the sand strikes, the impression made resembles ground glass. This process will probably supersede ground glass in many of its uses.

Dr. Pile exhibited a sample of insoluble gun cotton, made in the form of gun wad, being very explosive.

Dr. Bridges explained the principle of the spectroscope, its discovery, and the wonderful results obtained by its use. Although this species of chemical investigation is but in its infancy, the results so far obtained are marvellous, by which the minutest quantity of a substance is detected by an undeniable and never-failing color. After a very interesting exhibition of spectroscopes by the Prof., assisted by Mr. Bullock, the details of which would occupy too much space, the meeting adjourned.

At the meeting held on December 20th, among other things, Dr. Pile propounded and solved the following problems:

1st. To reduce alcohol of given strength to proof.

2d. To reduce alcohol to any required strength.

3d. To make any required quantity of either of the above.

Answer to Problem 1*st.*—Ascertain the percentage of the alcohol used, and to every 50 parts, by measure, add water sufficient to make the whole number of parts equal to the percentage. For example, if the alcohol be 85 per cent., then to 50 ounces add water sufficient to make 85 ounces.

Answer to Problem 2*d.*—To as many parts of the given alcohol as are indicated by the percentage required add sufficient water to make the number of parts of the mixture equal to the percentage of the given alcohol. For example, If it is desired to make an alcohol of 30 per cent. from an alcohol of 95 per cent., take 30 parts of the alcohol, add water sufficient to make 95 parts of the mixture.

Note.—In the first example we do not add to the 50 ounces of alcohol 35 ounces of water, but sufficient to make 85 ounces of the mixture. This is owing to the condensation occurring where alcohol and water are mixed.

Answer to Problem 3d.—Make the following proposition: As the percentage of the alcohol given is to that of the alcohol required, so is the quantity desired to the quantity of the alcohol to be taken; and to this quantity of alcohol water sufficient must be added to make up the required quantity. For example, Suppose 80 ounces of alcohol, of 75 per cent., is desired to be made from 95 per cent. alcohol—as 95 : 75 : : 80. This gives 63 3-19 ounces of 95 per cent. alcohol to be taken; to this add water sufficient to make 80 ounces.

	Alcohol	= 89·49	per cent.	by volume.
Dilute	"	= 46·	"	"
Strong	"	= 94·65	"	"

Mr. Bullock exhibited a specimen of anhydrous alumina, found in large masses weighing many pounds. Specific gravity, 3·60; next to the diamond, the hardest substance in nature. Surface studded with crystals of sapphire.

Dr. Pile spoke of the following prescription as being the cause of poisoning:

R. Strychnia Murias, ...	gr. iss.
Syrup Ferri Iod., ...	f ʒvj.
" Zingiberis, qs. ft.	f ʒiii. M.

Sig. Teaspoonful three times a day.

The question arose as to the cause of poisoning—whether these ingredients were incompatible. On this point, the Dr. said he had compounded the prescription, carefully dissolving the muriate of strychnia, and had kept the compound several months, without any sign of precipitation. It was supposed that in the original mixture the strychnia salt was undissolved, the last dose containing the greater part of the poison, which acted fatally.

Prof. Maisch read a paper "On the Precipitation of Quinia by Iodide of Potassium from an Acid Solution." (See *Am. Journal of Pharmacy* for February, 1871.)

Also a paper entitled "Decomposition of Acetate of Morphia in Solution," which will also be found in *Am. Journal of Pharmacy.* (See page 49 of this number)

Prof. Bridges made some remarks on the vinegar plant.

Prof. Parrish read a paper (illustrated with diagrams) upon "Petroleum, its Mode of Rectification and Refinement, together with its Commercial History." speaking of the immense use during the last few years, almost superseding other illuminating oils of commerce, and exposing some of the immense frauds practiced during the coal oil rage.

Several specimens of petroleum and its derivatives, in their different stages of refinement, were exhibited. (See *Journal Franklin Institute* for February, 1871.)

Editorial Department.

Spurious Quinine.—The following paper was received too late for insertion among the original matter, and its importance induces us to give it place in the editorial columns rather than delay its publication:

"SULPHATE OF QUININE."

An old Fraud in a dangerous Disguise.

By Charles Bullock.

Within the past few days there has been offered in this market a lot of sulphate of quinine (?) said to be five thousand ounces in quantity, purporting to be of the manufacture of Pelletier, Delondre et Levaillant, Paris. The bottles containing the drug bear the label, and the cork the seal, of that well-known firm.

An examination of the so-called sulphate of quinine (?) (which was offered at the market value, or thereabout, of quinine) shows that it contains scarcely a trace of quinine, but consists entirely of muriate of cinchonia mixed with small amounts of the other associated alkaloids of the bark.

The first impression was, that old bottles, from which the genuine labels had not been removed, had been used to perpetrate the fraud. A more careful examination, and comparison with a package known to be genuine, leads to the belief that the whole transaction—bottle, label, seal, and circular accompanying each bottle—is a counterfeit. This counterfeit, we are informed, is in the hands of parties in New York.

Language too strong can scarcely be used to condemn the baseness of such a transaction. It is bad enough to appropriate a well-known trade-mark, to obtain a market on the reputation of another; but to counterfeit label, circular, seal and trade mark, to cover a medicinal article of different character and much less value, with *intent* to deceive, indicates a quality of heart needing but a little more schooling to make a first-class rascal.

In the State of Pennsylvania, we have a law punishing the vendor of meats in a condition unsuited for consumption; but we believe there is no statute law in this State to reach the man who, for the sake of greed, willfully deceives his fellow when struggling against the inroads of disease, by offering to him cinchonine under the counterfeit garb and at the cost of quinine, while the drug bears about the same relation to quinine in medicinal as it does in commercial value.

It is hoped that our New York brethren are better protected by laws bearing on the subject; and if they can discover the perpetrator of this fraud, and obtain for him a diploma insuring to him ten years' sojourn at Sing Sing, the general judgment of the profession will be—"served him right."

It is somewhat amusing to notice in the circular accompanying the spurious quinine, that the method of detecting adulterations, is copied from the original,

and which affords a ready method of *nailing the lie* to every package of the counterfeit—

Viz: "1 gramme of sulphate of quinine, 4 grammes of ether, and 2 grammes of aqua ammonia, should form a clear solution."

Philadelphia, Jan. 26, 1871.

Relations Subsisting between Physicians and Apothecaries.—This subject constituted the theme of a paper, read by Dr. J. H. Burge, President of King's County Medical Society, (N. Y.,) before that society and published in the New York *Medical Journal* for Oct., 1870, occupying twelve pages. The paper is too long to copy, and we have not even space to offer an abstract, and therefore call attention to it so that those who have access to that *Journal* may read it. The subject is dispassionately treated, first dwelling on the conduct of physicians towards apothecaries, and then on that of the apothecaries towards physicians.

The main points of complaint by apothecaries are well stated and candidly admitted as just, and their recognition advocated.

Thus:—"For example, may he (the apothecary) not reasonably expect that we should recognize his professional character, and not look upon him simply as a vendor of drugs?

"That we should not steal away his custom by an endeavor to join the apothecary's art to the duties of physician.

"That we should by no careless insinuations lessen the proper confidence which his patrons repose in him.

"That we should write our prescriptions so legibly that there can be no doubt of our intention, and so fully and accurately as to burden him with no responsibilities, except such as properly belong to his office.

"That we should depend upon the fees of our own professional services for emolument, and never seek directly to draw revenue from the apothecary's till.

"Until we are willing to accord these rights and such as they imply, to the pharmaceutist it will be idle to talk of the other side of the question."

On the other hand, Dr. Burge contends that the physician has as just a right to demand "that his prescriptions should be dispensed by practical druggists and graduates of some legal and reliable college of pharmacy."

That he should in preference encourage those who discourage quackery.

That the evil of prescribing over the counter should be abated.

That the terms of the prescription should be rigidly adhered to, and substitution avoided.

That he has a right to be served with pure medicines.

These are the main points, which are discussed with illustrative examples of the manner in which apothecaries have disregarded them. The difficulty after all is, that in both professions there are men not governed by professional rules; men who are ignorant of their duties; men who are unscrupulous and trench on the rights of others, and hence the mutual complaints that arise. Apothecaries know better than physicians how many in the medical ranks disregard the rights of apothecaries and tempt them to do things in self-de-

fence that are wrong. The only way seems to advance education by legal enactments, to uphold the Pharmacopœia as a guide and standard by legal means, and to encourage professional integrity as the true means of reform.

The Authority of the Pharmacopœia.—A writer in the *Medical Times* (Philada. Jan. 2d) discusses the question as to how far our Pharmacopœia is a recognized code. What are the causes of its being disregarded, and whether the time is not approaching when the attempt will have to be made to get Congress to intervene in favor of a just and moderate law upholding the Pharmacopœia, which shall compel physicians to use officinal language when they want the preparations of that code, and compel apothecaries to dispense its formulæ when prescribed in officinal language. This will leave ample room for the non-professional prescribers, the homœopathist and the eclectic, as well as for the numerous specialities that will ever be arising outside of the Pharmacopœia among apothecaries. It will then become the interest of physicians to include within the national codex all that is most desirable for their prescriptions, and apothecaries to take so much interest in its revision as to see that it is well done.

The Proceedings of the Association.—We have received some advanced sheets of this volume through the politeness of Prof. Maisch, with the information that the work will soon be published. The execution of the few pages we have received speaks well for the appearance of the coming volume. Several of the essays appear in this number. Before our next issue it may be received in time for a general notice.

The Business Editor of the American Journal of Pharmacy.—Since our last issue, Mr. Henry H. Wolle has been appointed to the position of business editor for the management of the advertising sheet, the distribution and the accounts of the *American Journal of Pharmacy*. His office is at the Hall of the College, 145 North 10th street, Philadelphia, and all letters relating to the business of the *Journal* should be sent to him at that address. His office hour is from 9 to 10 o'clock daily, and when this is not convenient, subscribers, advertisers, and others having business with Mr. Wolle relating to the *Journal*, should reach him by note. The publishing committee are desirous that all subscribers should be faithfully served, and so far as committing the *Journal* to the mails is concerned, efforts have been made to do them justice. Beyond this the committee is not responsible, but desire to hear of failures when they occur.

As many subscribers are in arrears, they will greatly oblige the Committee by promptly paying their dues to Mr. Wolle, who will receipt for the same on Treasurer's account. When subscribers find their Journals are not properly addressed, they will help the Business Editor by promptly notifying him of the errors, and should bills be rendered for accounts already settled, but not credited, such parties will confer a particular favor on the Business Editor by send-

ing the date of such receipts and the name of the receiver. The Committee hope, in the course of a few months, to get their arrangements perfected to the satisfaction of all concerned.

Circular No. 3. *Approved Plans and Specifications for Post Hospitals.* Surgeon-General's Office, Washington, Nov. 23, 1870.

Circular No. 4. *War Department,* Surgeon-General's Office.

A Report on Barracks and Hospitals, with Descriptions of Military Posts. Washington, Dec. 5, 1870. Pages, 494. 4to. With numerous illustrations.

This valuable and exceedingly interesting "Report" from the office of the Surgeon-General has resulted from a series of systematic reports from surgeons located at the various posts, in answer to certain queries relative to the location, buildings, hygienic condition and surrounding influences, the character of the buildings, and generally some historical information, which often swells into notices of much interest.

The local reports are preceded by an introductory notice by Assistant-Surgeon John S. Billings, U. S. A., explanatory of the origin and objects of the work, which, besides presenting the merits and faults of the buildings, water supply, drainage, and other arrangements having a hygienic bearing on the troops, is intended to furnish the medical officers of the Army with reliable information in regard to every post to which they may be called to superintend.

The individual reports vary considerably, and indicate the tendencies of the reporters. Some embrace botanical and zoological notices of the localities, of value, especially in reference to the South and West.

The advantages that must arise from this publication will far outweigh its expense, and reflects credit on the department, as well as on the numerous medical officers who have contributed to its pages.

S. Maw, Son & Thompson's Quarterly Price Current. London, January, 1871. Pages, 104. Quarto.

Has been received.

The Year-Book and Almanac for 1871 of the New York Observer. Pages, 200. Octavo. Sydney E. Morse, Jr., & Co., 37 Park Row, N. York. Price, one dollar.

This useful annual is sent to the pre-paying subscribers of the New York Observer gratuitously. It contains a reprint of the first New York Directory, published in 1786. The amount of information of a statistical character embraced in this year-book is immense.

The Public Ledger Almanac for 1871. George W. Childs, Philadelphia; pp. 56. 12mo. From the proprietor.

This excellent annual, teeming with local and general information, is sent

gratuitously by Mr. Childs to the numerous subscribers of the Public Ledger. He proposes to continue it annually, this being the second year.

The Technologist; especially devoted to Engineering, Manufacturing and Building. January. Issued by the Industrial Publication Company, 176 Broadway, New York. Price, $2 per annum. Monthly.

Constitution, By-Laws and Code of Ethics of the Louisville College of Pharmacy, with a List of Members, Officers and Board of Trustees. Organized Aug. 16, 1870.

We have already noticed (Sept., 1870) the movement out of which this publication arises, and wish it success.

OBITUARY.

Marshall F. Rinehart, late of Troy, Ohio, a second course student at the Philadelphia College of Pharmacy, while spending the holidays at the home of his parents, in Maryland, was attacked with typhoid fever, which, after a short illness, resulted in his death on the 9th ult., in the 24th year of his age.

He was a young man of studious and moral habits, a favorite among his fellow-students, and was respected by all who knew him. At a meeting of the class of the College of Pharmacy held after the announcement of his death, suitable resolutions, expressive of regard for the deceased, were adopted.

Robert John Fowler, pharmaceutist, of the firm of Harvey Reynolds & Fowler, formerly of Leeds, England, died on the 8th of December, at his residence, 33 Rue Magnan, Paris. Having a tendency to phthisis, about four years ago he removed to Paris, the climate of which city suited him, and engaged in a commission chemical business. He was greatly respected, and leaves a widow and children, who mourn his loss in the beleaguered city.

T. W. Gissing, of Wakefield, England, a pharmaceutist of some standing, died on the 28th of December, after a short illness, aged 41 years. He was much respected in Wakefield, where he took much interest in local affairs for the advancement of education, art and science. He was the Local Secretary of the Pharmaceutical Society, and had been a candidate for the Council.